HP 24-Port 4x Fabric Copper Switch User Guide

Regulatory Notices v

1: Features Overview 1

2: Installing the HP 24-Port 4x Fabric Copper Switch.. 5

3: Managing Individual Components............ 13

4: Monitoring the HP 24-Port 4x Fabric Copper Switch... 17

5: Hardware Diagnostic Tests 25

6: Specifications and Compliance Certifications 31

Regulatory Notices

Regulatory Model Number

For the purpose of regulatory compliance certifications and identification, this product has been assigned a unique regulatory model number. The regulatory model number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this regulatory model number. The regulatory model number is not the marketing name or model number of the product.

Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Canadian Notice (Avis Canadien)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Regulatory Notice

This product complies with the following EU Directives:

•Low Voltage Directive 73/23/EEC
•EMC Directive 89/336/EEC

Compliance with these directives implies conformity to applicable harmonized European standards (European Norms) which are listed on the EU Declaration of Conformity issued by Hewlett-Packard for this product or product family.
This compliance is indicated by the following conformity marking placed on the product:

$C\!E$

This marking is valid for non-Telecom products
and EU harmonized Telecom products (e.g. Bluetooth).

$C\!E$ XXXX* ①

This marking is valid for EU non-harmonized Telecom products .
*Notified body number (used only if applicable - refer to the product label)

Japanese Notice

　この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Korean Notice

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니
판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약
잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기
바랍니다.

BSMI Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能
會造成射頻干擾，在這種情況下，使用者會被要求採
取某些適當的對策。

Battery Replacement Notice

Your computer is equipped with an internal lithium battery or battery pack. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Unless specific replacement instructions are provided as part of this guide, replacement is to be done by an authorized service provider using the HP spare designated for this product. For more information about battery replacement or proper disposal, contact your authorized reseller or your authorized service provider.

> ⚠ **WARNING: Your computer contains an internal lithium battery or battery pack. There is risk of fire and burns if the battery pack is not properly handled. To reduce the risk of personal injury:**
>
> ²   **Do not attempt to recharge the battery.**
>
> ²   **Do not expose to temperatures higher than 60°C.**
>
> ²   **Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.**
>
> ²   **Replace only with the HP spare designated for this product.**
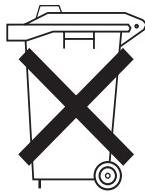
Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, please use the public collection system or return them to HP, your authorized HP partners, or their agents.

Taiwan Battery Recycling Notice

The Taiwan EPA requires dry battery manufacturing or importing firms in accordance with Article 15 of the Waste Disposal Act to indicate the recovery marks on the batteries used in sales, giveaway or promotion. Contact a qualified Taiwanese recycler for proper battery disposal.

Power Cord Statement for Japan

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

Electrostatic Discharge

Preventing Electrostatic Damage

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage when setting up the system or handling parts:

*   Avoid hand contact by transporting and storing products in static-safe containers.
*   Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
*   Place parts on a grounded surface before removing them from their containers.
*   Avoid touching pins, leads, or circuitry.
*   Handle parts by edges only.

- Avoid contact between the parts and clothing (for example, a wool sweater) . Wrist straps only protect parts of the body from ESD voltages.
- Do not wear jewelry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods To Prevent Electrostatic Damage

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity, or assistance with product installation, contact your authorized reseller.

Power Cords

The power cord set included with your product meets the requirements for use in with a power distribution unit in a rack environment. If you need use this server elsewhere, you should purchase a power cord that is approved for use in that environment and country.

The power cord must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product. In addition, the cross sectional area of the wire must be a minimum of 1.00 mm² or 18AWG, and the length of the cord must be between 6 feet (1.8 m) and 12 feet (3.6 m). If you have questions about the type of power cord to use, contact your Compaq authorized service provider.

A power cord should be routed so that it is not likely to be walked on or pinched by items placed upon it or against it. Particular attention should be paid to the plug, electrical outlet, and the point where the cord exits from the product

Contact Information

Table 1-1: Customer Contact Information

For the name of your nearest authorized HP reseller:	In the United States, call 1-800-345-1518.
	In Canada, call 1-800-263-5868.

Table 1-1: Customer Contact Information

For HP technical support:	In the United States and Canada, call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
	Outside the United States and Canada, refer to
	www.hp.com

1

Features Overview

The HP 24-Port 4x Fabric Copper Switch provides data center managers with a high-performance, low-latency interconnect.

System Architecture

InfiniBand Connectivity

The HP 24-Port 4x Fabric Copper Switch can be used in a variety of networking environments, including database tiers, application tiers, and web tiers. The HP 24-Port 4x Fabric Copper Switch provides 10 Gbps connectivity to servers.

InfiniBand™ (IB) enabled servers are automatically recognized as they are connected.

Scalability

The HP 24-Port 4x Fabric Copper Switch can scale to manage up to 256 hosts.

Hi-Availability

Hardware

The HP 24-Port 4x Fabric Copper Switch features hot-swappable redundant power and cooling.

Ports

No failure on any single IB port will result in interruptions in service for any of the other ports.

Fabric

For redundancy, IB Host Channel Adapters (HCAs) can be dual-connected to a redundant pair of HP 24-Port 4x Fabric Copper Switches.

In an IB fabric that includes more than one HP 24-Port 4x Fabric Copper Switch: if the subnet manager (SM) on the switch that is acting as the master fails, another SM will take over within seconds.

There should be no interruption in traffic on the IB fabric or on the failed device if the only part that failed was the management board, and all necessary state information is kept in sync.
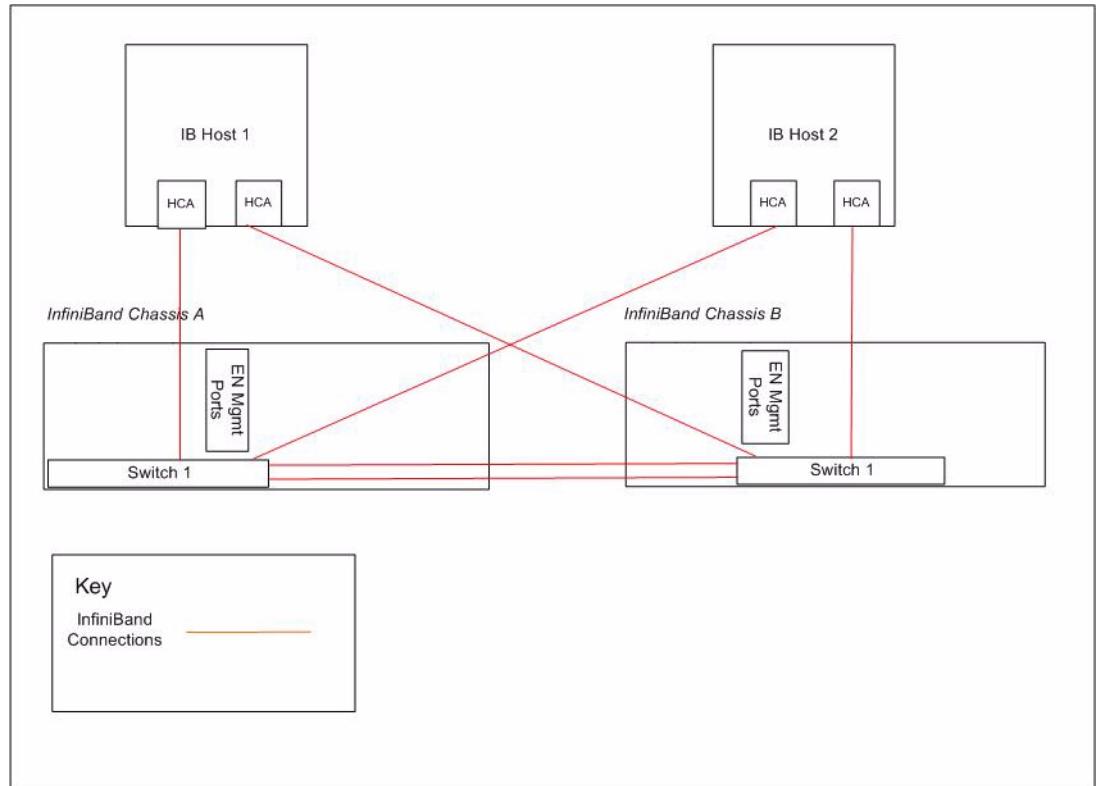
Figure 1-1: Example of Redundant InfiniBand Fabric

Non-Blocking Architecture

The HP 24-Port 4x Fabric Copper Switch provides non-blocking switch element architecture with full bisectional bandwidth for the switch chassis.

Switch Chassis

The HP 24-Port 4x Fabric Copper Switch includes the following hardware features.

Size

- **Height**: 1U unit
- **Width**: Standard 19-in rack-mount width
- **Weight**: 30 lbs

Connections

- 24 ports of 10 Gbps 4X Copper IB
- One 10/100 Ethernet RJ-45 Management-Ethernet port for out-of-band management
- One RJ-45 Console port used to configure and monitor the switch

LEDs

Chassis LEDs

The chassis LEDs show overall system status, power status, and fan status. LEDs and their use are described in "Chassis Status LEDs" on page 17.

InfiniBand Port LEDs

The IB port LEDs show link status, diagnostics, and network traffic. LEDs and their use are described in "Using the LEDs" on page 17.

Power Supplies/Fan Units

Refer to "Replacing a Power Supply/Fan Unit" on page 14 for more information.

About the Power Supply Bay

The chassis provides dual independent IEC connectors, left and right justified.

About the Power Supplies/Fan Trays

The power supplies are:

- redundant, and hot-swappable

  The replacement of any one power supply/fan tray does not disrupt the operation of the device in anyway, and can be successfully completed without having to remove the device from a rack, or disconnecting any cables.

- auto-ranging 90-264VAC, 47-63Hz.

Administrative Features

Real-Time Clock

The HP 24-Port 4x Fabric Copper Switch maintains correct time regardless of power conditions or connectivity.

Latency

The HP 24-Port 4x Fabric Copper Switch has port-to-port latency of less than 200ns.

Non-Volatile Memory

The memory supports up to:

- three stored system images (not including recovery image).
- one week of log files at normal verbosity, and one day of log files at maximum verbosity.

Vital Product Data Storage

Vital Product Data is stored in non-volatile memory in the power supply and is available electronically. The following Vital Product Data is accessible by the maintenance processor and made available to the RS-232 and Ethernet ports regardless of power conditions or connectivity.

- Power-on hours
- Manufacturing part number
- Serial number
- Final test date
- Card ID
- Failure code
- Failure date
- Operation status
- Failure log
- OEM part number

Diagnostics

Refer to for more detailed information.

The following tests are used to run to determine operational status:

- Power On Self Test (POST) is performed on all system components is required during power-on to determine operational readiness.
- Redundant components' operational status is ensured periodically during normal operation, including the logic required to perform the transition from faulted/primary to redundant component. Detection of abnormal status is reported.
- Concurrent port loopback tests, including the capability to wrap an external signal from input port to output port, are available.

2

Installing the HP 24-Port 4x Fabric Copper Switch

This chapter describes how to install and manage the HP 24-Port 4x Fabric Copper Switch hardware.

- "Preparing the Site" on page 5
- "Configuring Basic Connectivity" on page 6
- "Mounting the Switch Chassis in a Rack" on page 7
- "Connecting Network Devices" on page 9
- "Managing the System" on page 12

Preparing the Site

This section provides information that you need to safely and successfully prepare your environment for your HP 24-Port 4x Fabric Copper Switch. Read this section carefully before you install your device.

Reading the Cautionary Statements

Refer to the "Regulatory Notices" on page v".

Preparing the Physical Environment for the Switch

- Ground yourself using an approved ground wrist-strap.
- Make sure you have the right cables and sufficient ventilation.
- Unpack the HP 24-Port 4x Fabric Copper Switch package.
- Prepare a management workstation, such as a PC running a terminal program.

Configuring Basic Connectivity

Attaching a Serial Management Cable to a PC or Terminal

1. Connect the cable from the switch serial console to your terminal or management workstation. Use the straight-through serial management cable, which is provided in the HP 24-Port 4x Fabric Copper Switch package.

2. Open a terminal emulation window using a program such as HyperTerminal for Windows. Set your terminal parameters to the following:

    • Baud: **9600 bps**

    • Data Bits: **8**

    • Parity: **None**

    • Stop Bits: **1**

    • Flow control: **None**

Powering on the Chassis

Use only the power cables provided with your IB system or an equivalent cables.

1. Inspect the power cables and determine if they provide the proper plug and is appropriately certified for use with your electrical system. Discard the cables if they are inappropriate for your national electrical system and obtain the proper cable, as required by your national electrical codes or ordinances.

    Grounding is supplied by the ground-prong on the 3-prong power plug. Do not attach a separate ground cable. Do not use adapter plugs. Do not remove the ground prong from the cable. Ensure the ground connection on the power supply is correct and functioning before applying power to the chassis.

2. Remove the power cables from the shipping package. There should be two power cables, IEC C14.

3. Insert the power cables to the power jacks on the rear of the chassis. Refer to Figure 2-1 for power jack locations.
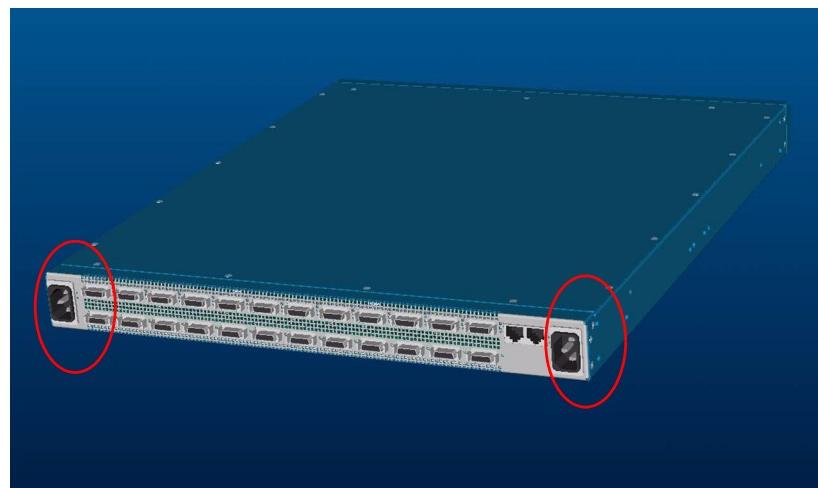

Figure 2-1: Power Jack Locations

4. Plug the other end of each power cable into a 90-264VAC power outlet operating at 47-63Hz.

The chassis automatically starts and boots. Use the correct external power source. Attach the chassis only to approved power sources, as indicated by the electrical ratings label. If you are unsure of the correct power source to use, contact your support personnel or your local power company.

5. Check the LEDs on the front of the HP 24-Port 4x Fabric Copper Switch. When the system first powers up, it performs a power-on self test (POST). Refer to "Using the LEDs" on page 17.

6. In the terminal emulation window of the system being used to administer the switch, press **Enter** one or more times to display the CLI prompt.

```
Login:
```

Once you see this prompt, you can log in and assign a network address.

The default login is:

• **super**

• **super**

Proceed to the *HP 24-Port 4x Fabric Copper Switch User Guide* for additional management information.

Mounting the Switch Chassis in a Rack

This section describes how to install the HP 24-Port 4x Fabric Copper Switch chassis in an equipment rack.

Requirements

In addition to the accessories provided with the switch, you should have:

• A #1 Phillips screw driver

• 12 screws and any associated mounting clips to secure the brackets to your rack (2 for each rail of the rack).

NOTE: Note: Installing the switch chassis into the rack with screws other than the ones provided could be hazardous.

Two people are recommended to perform install.

Rack Mount Installation

To mount the switch chassis in a rack:

1. Remove the chassis, rack brackets, parts bag, and documentation from the box.

2. Place the chassis on a secure, clean surface.

3. Open the plastic bag containing mounting parts.

4. Check the slot in the rack for sufficient clearance.

5. Install the switch. Refer to "Installing the Switch" on page 8.

Installing the Switch

The following method of installation requires two people to mount the chassis into the rack. One person holds the switch while another person secures it to the rack.

1. Separate the assembled rack brackets.
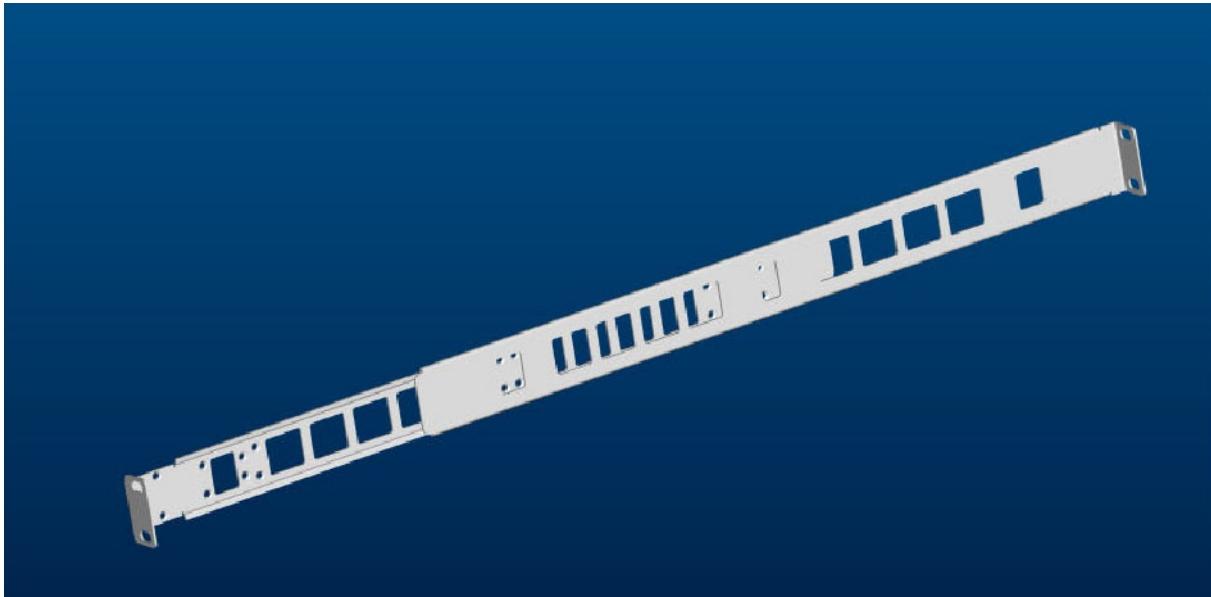
Figure 2-2: Separate Assembled Brackets before Mounting onto Switch

2. Attach the rack bracket that has screw holes to the sides of the switch chassis with the screws provided.

   When attaching the rack bracket, the flanges of the rack bracket should be facing away from the switch chassis, as shown in Figure 2-3.
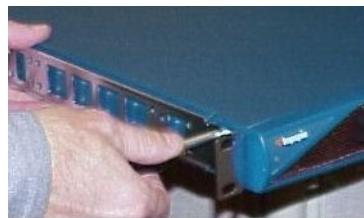
Figure 2-3: Fasten Bracket to Switch Chassis

3. Assemble rack bracket to their counterparts before inserting the switch into the rack.
4. Insert the switch into the rack with the rack bracket attached. You will have to tilt the switch unit to one side to avoid hitting the sides of the rack bracket with the brackets as they pass around the back rails.

   Return the switch unit to a horizontal position once the switch is inside the rack. The rear bracket flanges should wrap around the outside of the back rack post.

5. Have one person hold the switch while another person secures the switch to the rack.
6. Maintain at least six inches between the cooling vents and any obstructions.
7. Attach the rack bracket to the back of the rack posts with the screws included with the switch.

8.   Attach the front rails to the front of the rack with the included screws, as shown in Figure 2-4.

Figure 2-4: Secure the Switch Through the Front Rack Rail

Connecting Network Devices

This section describes how to connect the IB system to other network devices. IB devices can be connected to IB-enabled servers.

About Connectors

The HP 24-Port 4x Fabric Copper Switch supports the following types of connectors:

*   Management ports
    *   Serial console port—male DB-9 connector
    *   Ethernet Management port—RJ-45 jack for unshielded twisted-pair connections
*   Switch card—4x 10 Gbps IB connectors

Connecting InfiniBand Devices

To connect using IB to other workstations or switches, standard 4x IB cables are required. IB cables can be used to connect any two IB devices, whether switch or host.
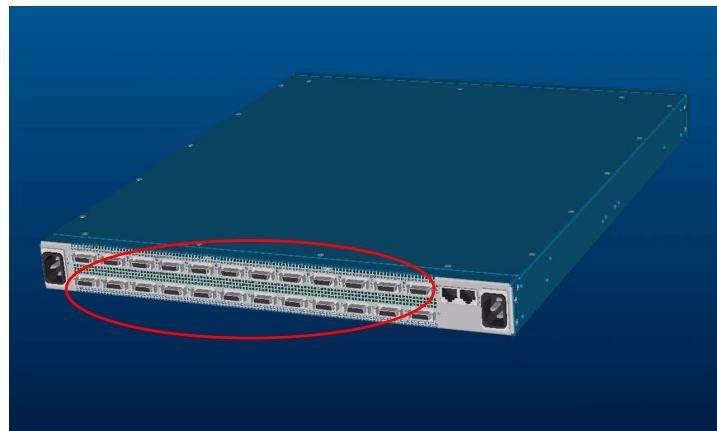
Figure 2-5: InfiniBand Port Connections

Plug IB cables from the host to the IB switch.

1. To plug in an IB cable, push the connector into the interface until you hear/feel a click.
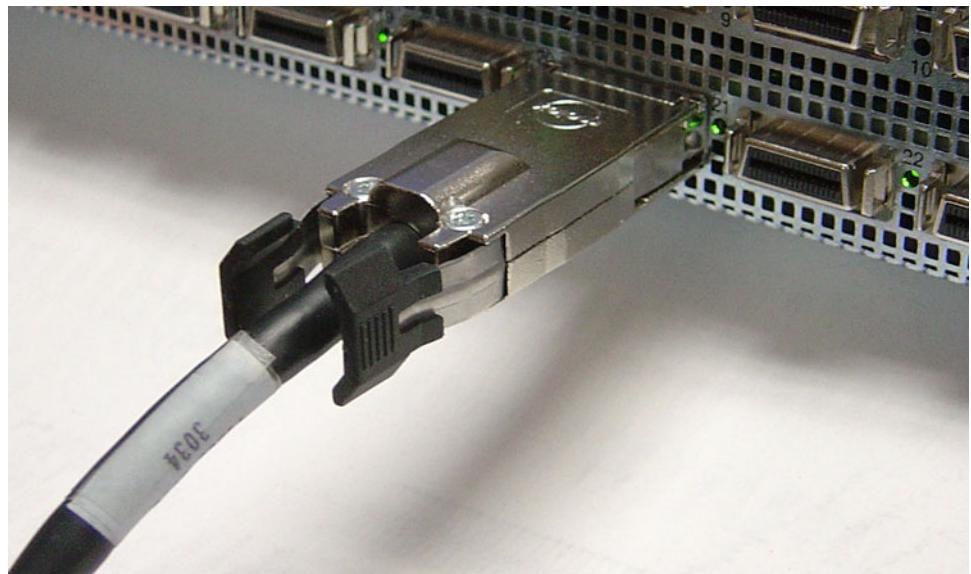
Figure 2-6: Fully Installed InfiniBand Cable with Pinch Connector

Figure 2-7: Fully Installed InfiniBand Cable with Pull Connector

NOTE: If your host does not provide an ample amount of free space around a given IB port, double-check that your IB cable connector engages fully. Wiggle your connector back and forth to be sure that both sides of the connector have locked firmly into place.

2. To remove a cable with a pinch connector, pinch both sides of the back of the connector and pull the connector away from the port.
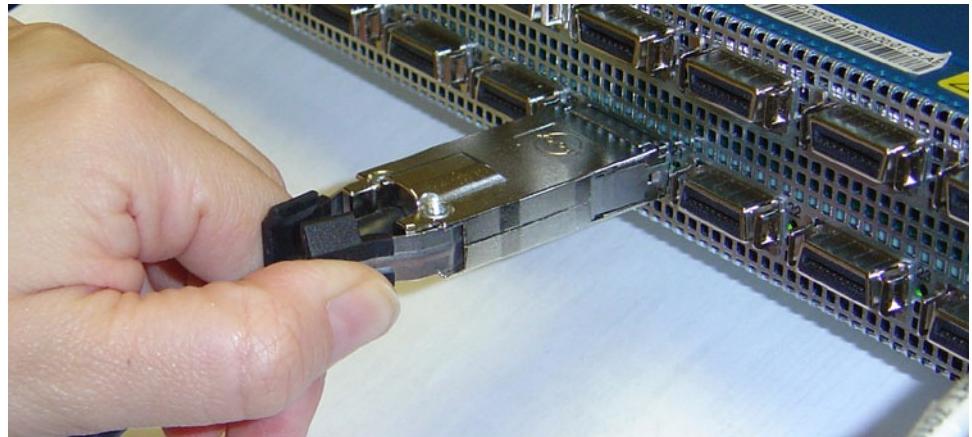
Figure 2-8: Removing a Pinch Connector

3. To remove a cable with a pull connector, grasp the connector with one hand and push it *toward* the port. Then pull the latch away from the port with your other hand and gently wiggle the connector away from the port.
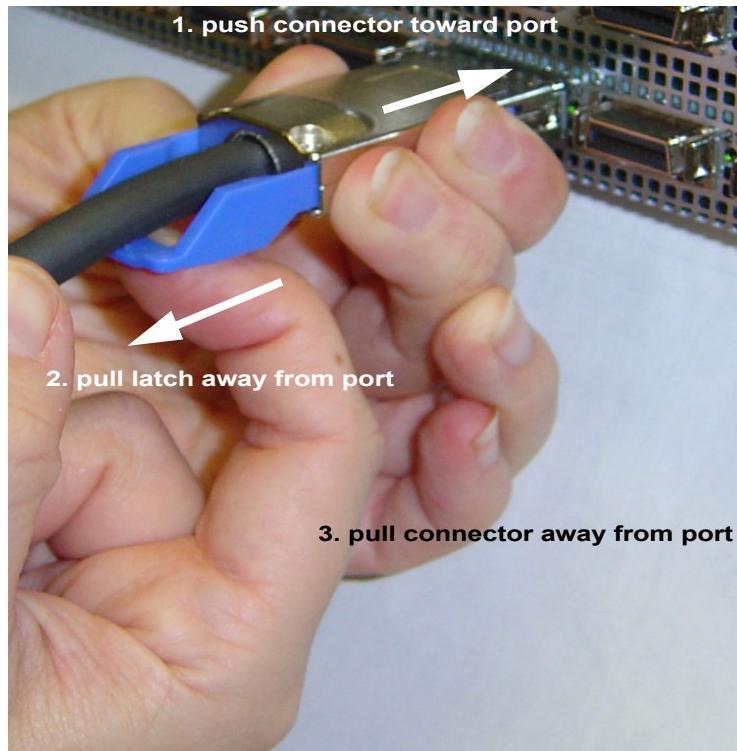
Figure 2-9: Removing a Pull Connector

Connecting Management Devices

To connect the management ports, use either a serial cable or an Ethernet cable.
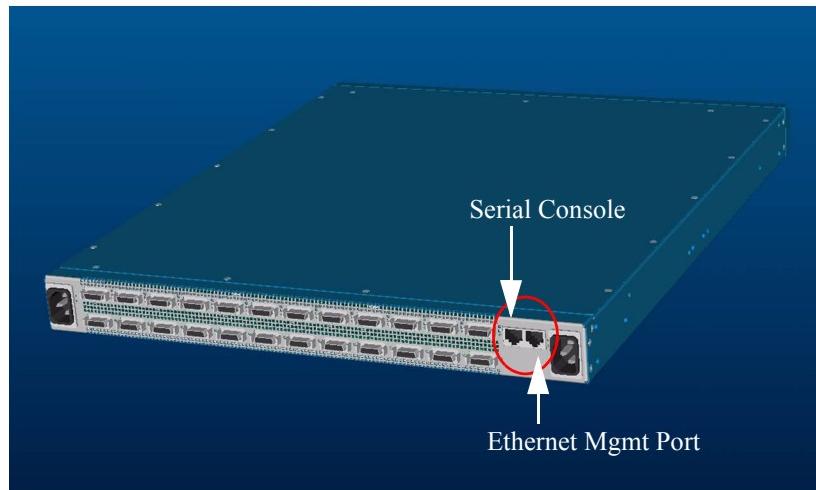
Figure 2-10: Serial and Ethernet Management Ports

Cascading Multiple Switches

Multiple switches can be linked together usin gIB cables. There are no limits regarding the ports that can be used to create an Inter-Switch Link (ISL) between the HP 24-Port 4x Fabric Copper Switch or any other Topspin switch. All switches in a connected fabric whould be active and able to pass traffic, but only one switch would have an active SM. A secondary switch would have a standby SM, and additional switches should have the SM disabled.

It is recommended that you enable Database Synchronization when connecting multiple switches Refer to the *Element Manager User Guide* or the *HP 24-Port 4x Fabric Copper Switch Command Line Interface Reference Guide* for instructions on configuring the SM and Database Synchronization.

Managing the System

You can manage the IB server-switch system using the following methods:

- Command Line Interface (CLI)—a text-based interface accessible through a direct serial connection, Telnet over IP, or SSH over IP

- Chassis Manager (GUI)—A web-based graphic user interface.

- Element Manager (GUI)—A graphic interface installed on a workstation, accessible over IP.

For more information about managing the IB system, refer to the following:

- *HP 24-Port 4x Fabric Copper Switch User Guide*

- *HP 24-Port 4x Fabric Copper Switch Command Line Reference Guide*

- *HP 24-Port 4x Fabric Copper Switch Chassis Manager User Guide*

3

Managing Individual Components

This chapter describes how to install the power/fan modules in the HP 24-Port 4x Fabric Copper Switch.

Power/Fan Modules

The HP 24-Port 4x Fabric Copper Switch power supplies/fan units are hot-swappable. You can add a second module without powering off the chassis. If you have two power/fan units installed, you can remove one of them without removing power from the chassis.

About a Failed Power/Fan Unit

If you believe a power supply module has failed, check the LEDs and view the status through the Element Manager (EM).

In most cases, vital information can be retrieved from the console port of Management Ethernet port. Refer to .

Locating the Power Supply/Fan Unit

Each power supply and fan unit is a single module. Both power/fan units are located on the front of the chassis. When facing the front of the switch with the bezel cover removed, the power modules are located in the left and right receptacles of the switch chassis.

Replacing a Power Supply/Fan Unit

⚠

CAUTION: Never place your hand inside an empty card or module bay. You should never have cause to place a hand anywhere inside the switch chassis.

⚠

CAUTION: To ensure proper safety, ventilation and cooling power supply bays should not be left empty.

To insert a power/fan unit:

1. Ground yourself appropriately.
2. Remove the bezel cover from the front of the switch.

3. Remove the power supply/fan unit, if one is in place by pulling on the black handle.
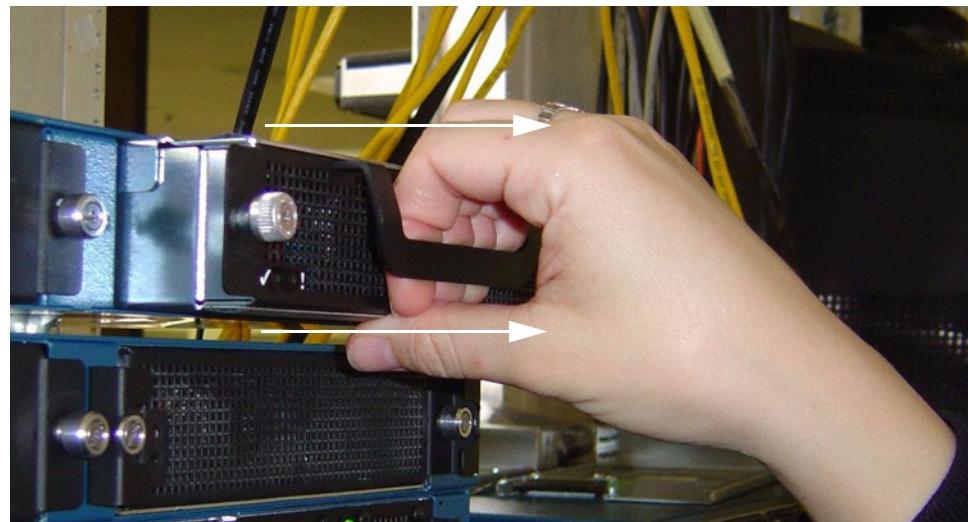
4. Insert the new power supply/fan unit into the open slot until it is fully seated. You may need to push the unit with your thumbs, to get it completely into the bay.
5. Secure fasteners with a #1 phillips screwdriver.

6. Check the LEDs to verify the status of the module. Refer to .
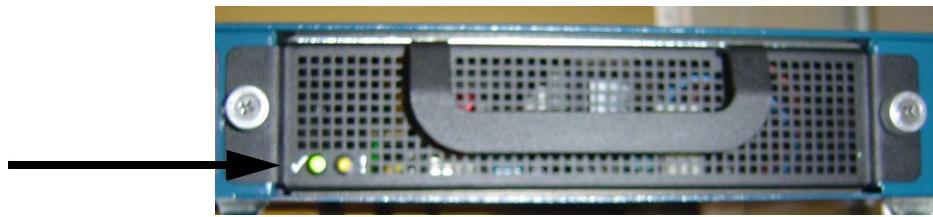
4

Monitoring the HP 24-Port 4x Fabric Copper Switch

This chapter describes how to install and manage the HP 24-Port 4x Fabric Copper Switch hardware.

Using the LEDs

The HP 24-Port 4x Fabric Copper Switch has the following types of LED indicators:

Chassis Status LEDs

Location

The front of the chassis has a single bi-color chassis status LED, which is located behind the bezel. The rear of the chassis has one green and one yellow system status LED.

Interpreting the Chassis LEDs

Table 4-1: Interpreting the Chassis LEDs

color	indication
off	No system power or LED failure.
Yellow (solid)	Operator intervention required. A system error was detected, such as a Fan error, a POST failure, or a power supply failure. The "**!**" label (available on the back of the chassis) indicates a failure.
Yellow (blinking)	The yellow blinking LED is initiated automatically during the LED test that follows the application of power (16 seconds).
Solid Green	Solid green indicates proper operation and no critical errors

InfiniBand Port LEDs

Location

The IB port LED is located next to each IB port. The IB LED represents the logical link and the logical link activity.
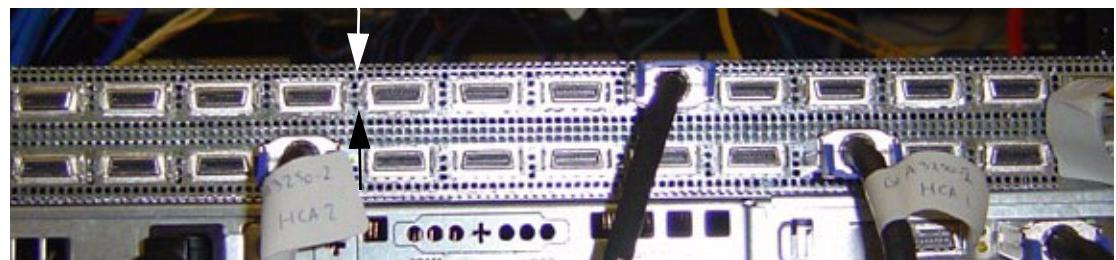
Interpreting the InfiniBand Port LED

Table 4-2: Interpreting the InfiniBand Port LED

color	indication
off	Logical link has not been established.
Solid Green	Logical link established.
Blinking Green	Logical link with activity.

Power Supply/Fan LEDs

Location
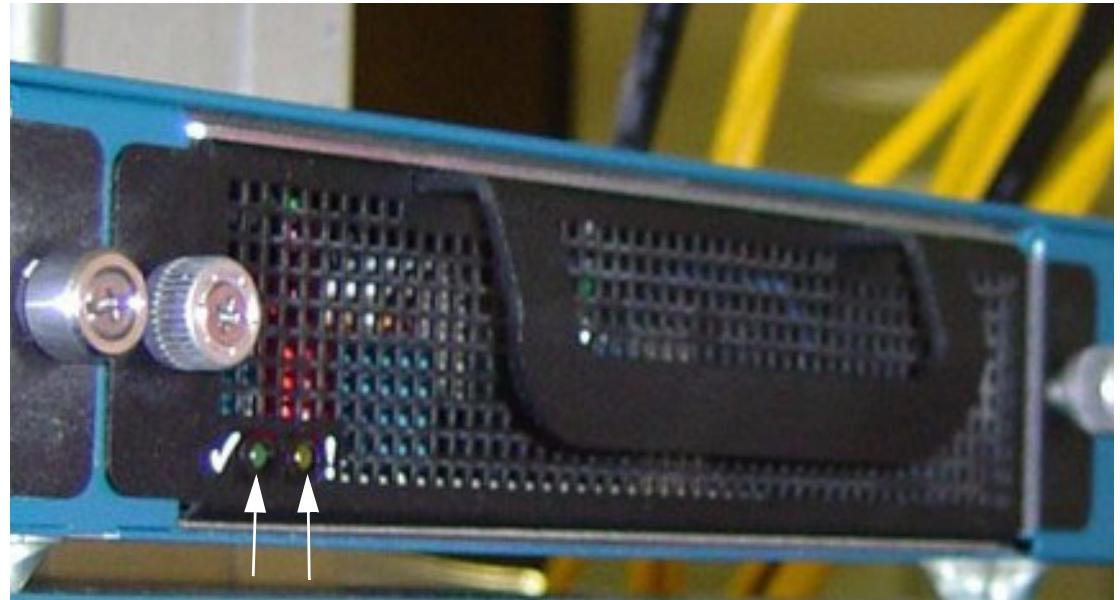
The power supply/fan unit LEDs are located on the bottom left corner of each power supply/fan unit.

•   the green LED is labelled with "OK" or a ⊟ symbol.

•   the yellow LED is labelled with a "!" symbol

Interpreting the Power Supply/Fan Unit LEDs

Table 4-3: Interpreting the Power Supply/Fan Unit LEDs

color	indication
off	DC output failure.
Green (solid)	AC connected, DC output OK.
Yellow (off)	No failure on the power supply.
Yellow (solid)	Operator intervention required. Failure detected within the power supply.

Table 4-3: Interpreting the Power Supply/Fan Unit LEDs

color	indication
Yellow (blinking)	Identify. Assists in identifying a particular Field Replaceable Unit (FRU) on the chassis.
	Must be initiated by the user.
	This LED can be initiated manually by using the **diag rack-locator** command in the global configuration mode, or is initiated . Refer to the *HP 24-Port 4x Fabric Copper Switch Command Line Reference Guide* for more information.
	Example:
	To run identity test on power supply 1:
	config mode -> **diag power-supply 1** -> **test led** ->
	-> **start** - start flashing
	-> **stop** - stop flashing

Monitoring the System with Element Manager

For information regarding installing the EM, refer to the *HP 24-Port 4x Fabric Copper Switch User Guide*.

1. Launch the EM.
2. Select **Health** > **Status**. The Health Status window opens.
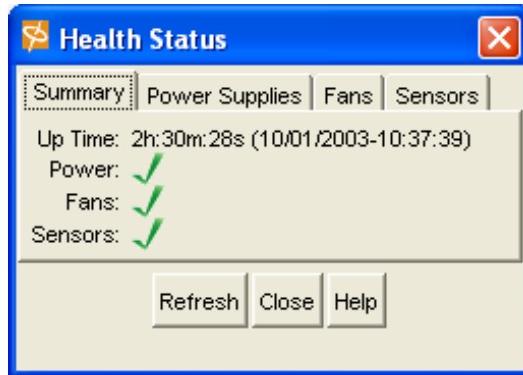
Interpreting the Summary Tab

Use the **Summary** tab to view the status of the power, fans, and temperature sensors at once.

Interpreting the **Power** Field

*   A green check next to the Power summary indicates that at least one power source is connected and functioning properly.
*   A red check mark indicates that power supply AC is disconnected.

Interpreting the **Fans** field

*   A green check next to the Fans summary indicates at least one fan is present, and functioning properly.
*   A red check indicates a fan failure.

*Interpreting the **Sensors** field*

- A green check next to the Sensors summary indicates that the system temperature is at an acceptable level.
- A red check for Sensor is a warning of high temperature.

Interpreting the Power Supplies Tab

Use the **Health** > **Status** > **Power Supplies** tab to view the operating status of the power supplies.

Health Status

Summary | Power Supplies | Fans | Sensors

PsId	Type	OperStatus	Utilization	Voltage	ProductSerialNum	PcaSerialNum	PcaAssemblyNum	FruNum
1	ac	up	n/a	12	n/a	n/a	n/a	n/a

Refresh   Close   Help

Data cached at 10:43:13
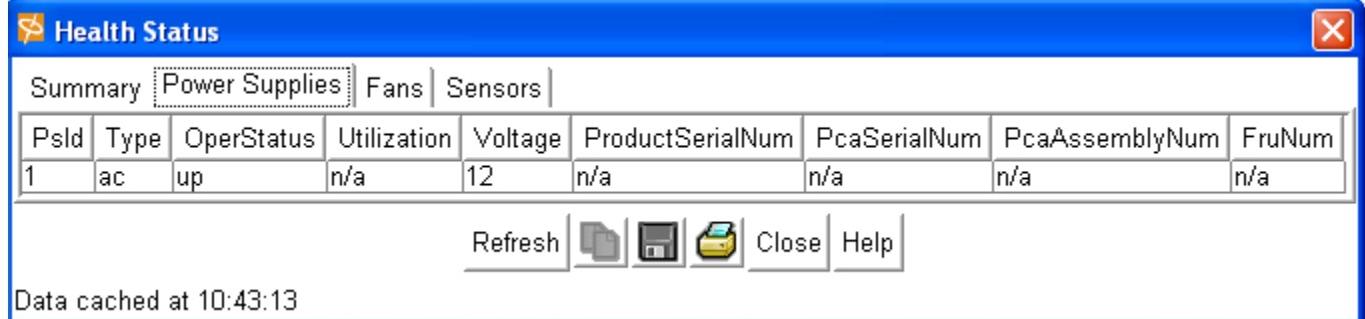
Interpreting the Fans Tab

Use the **Health** > **Status** > **Fans** tab to view the operating status of the fans.

Health Status

Summary | Power Supplies | Fans | Sensors

FanId	OperStatus	Speed	ProductSerialNum	PcaSerialNum	PcaAssemblyNum	FruNum
1	up	68	n/a	n/a	n/a	n/a
2	up	74	n/a	n/a	n/a	n/a
3	up	68	n/a	n/a	n/a	n/a

Refresh   Close   Help

Data cached at 10:43:16
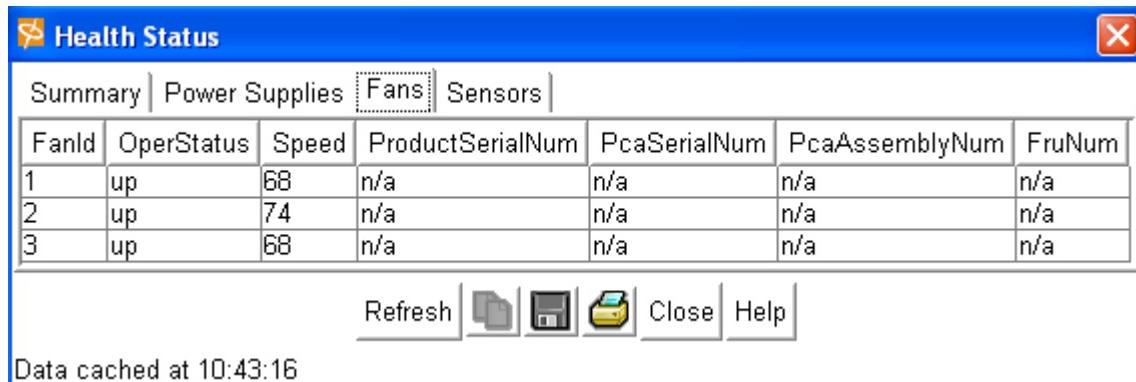
- Note the **OperStatus** field. A status of "up" means that the blower is operating correctly within the power/blower unit.
- Note the **Speed** field. The integer in this field represents a percentage. The percentage changes based on the ambient temperature of the unit, and will increase as the temperature rises.

Interpreting the Sensors Tab

Use the **Health** > **Status** > **Sensors** tab to view the operating status of the temperature sensor of the system.
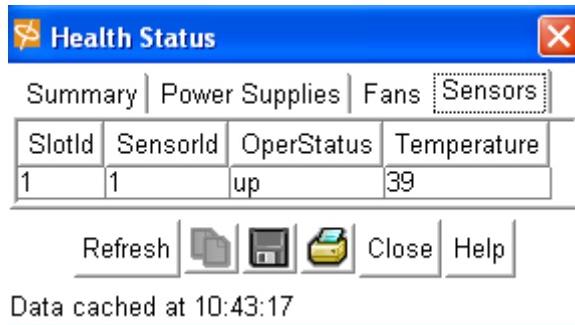
- Note the **OperStatus** field. A status of "up" indicates that the sensor is functioning properly.
- Note the **Temperature** field. The internal system temperature is displayed in Celsius. The system's maximum external ambient temperature is 35 degrees C (0 – 10,000 ft). Acceptable internal temperature ranges are 30 degrees C above external ambient, plus 1 degree for every 1,000 ft above sea-level. The system reboots at an internal temperature of 75 degrees C.

  A warning will appear if the temperature reaches 65 degrees C (at sea level).

  The system reboots at an internal temperature of 75 degrees C (at sea level).

Monitoring the System with the CLI

Use the following CLI commands to monitor the Power Supplies, the fans, and the sensors:

Monitoring the Power Supplies

show power-supply

Example

```
HP# show power
==================================================================
                    Power-supply Information
==================================================================
ps     type     oper-status     utilization     voltage
------------------------------------------------------------------------
1      AC       up                  55              12
2      AC       up                  55              12


==================================================================
                    Power-supply Seeprom
==================================================================
        product               pca               pca              fru
ps      serial-number         serial-number     number           number
------------------------------------------------------------------
1       200000                820000            820000           1
2       200000                820000            820000           1
HP#
```

Monitoring the Fans

show fan

An **oper-status** of "up" means that the blower is operating correctly within the power/blower unit.

Note the **Speed** field. The integer in this field represents a percentage. The percentage changes based on the ambient temperature of the unit, and will increase as the temperature rises.

Example

```
HP# show fan


================================================================================
                                Fan Information
================================================================================
fan    oper-status    speed(%)
--------------------------------------------------------------------------------
1      up                68
2      up                74
3      up                80
4      up                80
```

Monitoring the Sensors

show sensor

Example

```
HP-120# show sensor
==============================================================
                           Sensor Information
================================================================================
sensor     oper-status    temperature(c)
------------------------------------------------------------------
1/1        up                42
12/1       up                36
HP#
```

- Note the **Temperature** field. The internal system temperature is displayed in Celsius. The system's maximum external ambient temperature is 35 degrees C (0 – 10,000 ft). Acceptable internal temperature ranges are 30 degrees C above external ambient, plus 1 degree for every 1,000 ft above sea-level.

  A warning will appear if the temperature reaches 65 degrees C (at sea level).

  The system reboots at an internal temperature of 75 degrees C (at sea level).

5

Hardware Diagnostic Tests

This chapter describes how to run diagnostic tests on the HP 24-Port 4x Fabric Copper Switch hardware.

Diagnostic Tests

The Self Test

For complete diagnostic command information, refer to the *HP 24-Port 4x Fabric Copper Switch Command Line Reference Guide*.

The HP 24-Port 4x Fabric Copper Switch provides the following diagnostic tests:

- Card Test
- Interface Test
- Power/Fan

Running a Card Self-Test

To perform a diagnostic self-test on a card:

1. Enter the **diag card #** command. You cannot stop the card test once it has begun.

Example

```
HP> enable
HP# config
HP(config)# diag card 1
HP(config-diag-card-1)# test self-test
HP(config-diag-card-1)# start
```

2. Exit the test to view the progress of the test. The test takes approximately 5 - 8 minutes.

Example of test in progress

```
HP(config-diag-card-1)# exit
HP(config)# exit
HP# show diagnostic card 1
===============================================================================
                            Diagnostic Tests For Cards
===============================================================================
                      test : self-test
                   slot-id : 1
                iterations : 1
                    action : start
                    result : In progress
      percentage-completed : 0
             result-string :
```

Example of completed test

```
HP(config-diag-card-1)# exit
HP(config)# exit
HP# show diagnostic card 1
===============================================================================
                            Diagnostic Tests For Cards
===============================================================================
                      test : self-test
                   slot-id : 1
                iterations : 1
                    action : start
                    result : success
      percentage-completed : 100
             result-string : Card Test, Final report : PASSED; Please reboot
system
```

3. Use the **more** *file-system:file-name* command to display the log file and view the detailed results of the **diag** test.

Example of log results

```
HP# more syslog:hwif_log
Thu Mar  4 10:57:49 2004: POST: SEEPROM: PASSED
Thu Mar  4 10:57:49 2004: POST: FPGA: PASSED
Thu Mar  4 10:57:49 2004: POST: SUMMIT: PASSED
Thu Mar  4 10:57:50 2004: POST: RTC: PASSED
Thu Mar  4 10:57:54 2004: POST: FAN: PASSED
Thu Mar  4 10:57:54 2004: card_startup.x : card is starting up
Thu Mar  4 10:57:54 2004: Anafa2Init: a2update set to IGNORE
Thu Mar  4 10:58:16 2004: Anafa2 POST: firmware check PASSED
Thu Mar  4 19:01:55 2004: POST: SEEPROM: PASSED
Thu Mar  4 19:01:55 2004: POST: FPGA: PASSED
Thu Mar  4 19:01:55 2004: POST: SUMMIT: PASSED
Thu Mar  4 19:01:56 2004: POST: RTC: PASSED
Thu Mar  4 19:02:00 2004: POST: FAN: PASSED
Thu Mar  4 19:02:00 2004: card_startup.x : card is starting up
Thu Mar  4 19:02:00 2004: Anafa2Init: a2update set to IGNORE
Thu Mar  4 19:03:56 2004: POST: SEEPROM: PASSED
Thu Mar  4 19:03:56 2004: POST: FPGA: PASSED
Thu Mar  4 19:03:57 2004: POST: SUMMIT: PASSED
Thu Mar  4 19:03:58 2004: POST: RTC: PASSED
Thu Mar  4 19:04:02 2004: POST: FAN: PASSED
Thu Mar  4 19:04:02 2004: card_startup.x : card is starting up
Thu Mar  4 19:04:02 2004: Anafa2Init: a2update set to IGNORE
Thu Mar  4 19:04:23 2004: Anafa2 POST: firmware check PASSED
Thu Mar  4 19:07:07 2004: POST: SEEPROM: PASSED
Thu Mar  4 19:07:07 2004: POST: FPGA: PASSED
Thu Mar  4 19:07:07 2004: POST: SUMMIT: PASSED
Thu Mar  4 19:07:08 2004: POST: RTC: PASSED
Thu Mar  4 19:07:12 2004: POST: FAN: PASSED
Thu Mar  4 19:07:12 2004: card_startup.x : card is starting up
Thu Mar  4 19:07:12 2004: Anafa2Init: a2update set to IGNORE
Thu Mar  4 19:07:34 2004: Anafa2 POST: firmware check PASSED
Fri Mar  5 16:19:48 2004: POST: SEEPROM: PASSED
Fri Mar  5 16:19:48 2004: POST: FPGA: PASSED
Fri Mar  5 16:19:48 2004: POST: SUMMIT: PASSED
Fri Mar  5 16:19:49 2004: POST: RTC: PASSED
Fri Mar  5 16:19:53 2004: POST: FAN: PASSED
Fri Mar  5 16:19:53 2004: card_startup.x : card is starting up
Fri Mar  5 16:19:53 2004: Anafa2Init: a2update set to IGNORE
Fri Mar  5 16:20:15 2004: Anafa2 POST: firmware check PASSED
Fri Mar  5 16:21:54 2004: POST: SEEPROM: PASSED
Fri Mar  5 16:21:54 2004: POST: FPGA: PASSED
<output truncated>
```

4. Enter **reload** to reboot the switch after the test is complete. If you do not reboot the switch after running the self-test, the switch will remain in an unknown state.

Running a Test on the Power Supply/Fan

The status for a power supply and fan for the switch are shown together because they are a single unit.

Enter the **diag power-supply** command.

Example

```
HP> enable
HP# config
HP(config)# diag power-supply all
```

Running an LED Test on the Power Supply/Fan

Example

```
HP(config)# diag power-supply 1
HP(config-diag-power-supply-1)# test led
HP(config-diag-power-supply-1)# start
HP(config-diag-power-supply-1)# stop
HP(config-diag-power-supply-1)#
```

Displaying Hardware Errors

To display POST results, non-fatal errors that are recovered, informational logging (such as firmware updates), and hardware errors, use the **more syslog:hwif_log** command to locate the /topspin/log/hwif_log.

Example of output without errors

```
HP> enable
HP# more syslog:hwif_log
Thu Mar  4 10:57:49 2004: POST: SEEPROM: PASSED
Thu Mar  4 10:57:49 2004: POST: FPGA: PASSED
Thu Mar  4 10:57:49 2004: POST: SUMMIT: PASSED
Thu Mar  4 10:57:50 2004: POST: RTC: PASSED
Thu Mar  4 10:57:54 2004: POST: FAN: PASSED
Thu Mar  4 10:57:54 2004: card_startup.x : card is starting up
Thu Mar  4 10:57:54 2004: Anafa2Init: a2update set to IGNORE
Thu Mar  4 10:58:16 2004: Anafa2 POST: firmware check PASSED
Thu Mar  4 19:01:55 2004: POST: SEEPROM: PASSED
Thu Mar  4 19:01:55 2004: POST: FPGA: PASSED
Thu Mar  4 19:01:55 2004: POST: SUMMIT: PASSED
Thu Mar  4 19:01:56 2004: POST: RTC: PASSED
Thu Mar  4 19:02:00 2004: POST: FAN: PASSED
Thu Mar  4 19:02:00 2004: card_startup.x : card is starting up
Thu Mar  4 19:02:00 2004: Anafa2Init: a2update set to IGNORE
<output trucated>
```

In the following example the fan did not pass the POST test.

Example of output with error

```
# ./hw_diag.x post
POST: SEEPROM: PASSED
POST: VPD: PASSED
POST: FPGA Revision = 0xa8
POST: FPGA: PASSED
POST: SUMMIT: PASSED
POST: RTC: PASSED
POST: FAN ctlr2: fan 2 speed 330 is not in range for 100 percent of speed 9500;
system yellow LED on: FAILED
```

In the following example, the Field Programmable Gate Array (FPGA) is not working correctly.

Example of output with error

```
# ./hw_diag.x post
POST: SEEPROM: PASSED
POST: VPD: PASSED
POST: FPGA Revision = 0xa8
POST: FPGA: system yellow LED on: FAILED
POST: SUMMIT: PASSED
POST: RTC: PASSED
POST: FAN ctlr2: PASSED
```

Error Types

The following types of hardware errors are logged for the switch baseboard.

Table 5-1: Switch Baseboard Errors

Error Number	Description
1	Summit Power Controller Configuration Error
2	I2C Communication Error
3	Serial EEPROM Error
4	DiskOnChip Error
5	Memory Error
6	March SSO Error
7	Realtime Clock Error
8	Fan Error
9	FPGA Error
10	Summit High Temp Error
12	Summit High Current Error
14	Summit Voltage Out of Range Error
16	Firmware Error on the switch chip
17	Bus error on switch chip
18	ID Module Error
19	Management Module Error

The following types of hardware errors are logged for the HP 24-Port 4x Fabric Copper Switch power supply.

Table 5-2: Switch Power Supply Errors

Error Number	Description
1	Power Supply DC Fail Error
2	Power Supply Fan Fail Error
3	Power Supply I2C Communication Error

6

Specifications and Compliance Certifications

This chapter details the HP 24-Port 4x Fabric Copper Switch specifications and compliance certifications.

Chassis and Management Interface

Table 6-1: Chassis and Management General Specifications

Environmental Specifications	
Operating Temperature	0 to 35C
Non-Operating Temperature	-40 to 70C
Operating Temperature Gradient	20C max. per 60 minutes
Operating Altitude	0 to 10,000 ft
Non-Operating Altitude	0 to 40,000 ft
Operating Humidity:	8 to 80% non-condensing
Non-Operating Humidity:	5 to 90% RH at 65C for 24 hrs., Non-condensing
Operating Humidity Gradient	10% maximum per 60 min.
Operating Shock	5G max., 11ms half-sine wave., 10G max. 5ms half-sine wave
Non-Operating Shock	10G max., 11ms half-sine wave.
Operating Vibration, Sinusoidal	0.25G max., 3-200Hz 15min.
Non-Operating Vibration, Sinusoidal	0.50G max., 3-200Hz 15min.
Non-Operating Vibration, random	2.09Grms, 3-axis, bottom/top, left/right, front/back

Table 6-1: Chassis and Management General Specifications

Environmental Specifications	
Max. Operating Inclination	15 degrees

Electrical Specifications

Table 6-2: Electrical Specifications

Category	Specification
AC Input	Auto-ranging 90-264VAC, 47-63Hz.
Power consumption	< 65W

EMC/Immunity

Table 6-3: EMC/Immunity

Description
FCC: CFR 47 Part 15, Subpart B Class A
Canada: ICES-003 Issue 2
EN 61000-3-2 (Harmonics), EN 61000-3-3 (Flicker), EN 55022:1998, EN 55024:1998; EN61000-4-1,2,3,4,5,6,8,11
Japan: VCCI-V3/02.04

Safety

Table 6-4: Safety

Country Deployment	Description
USA	UL60950, 3rd ed.
Canada	CSA 22.2 No. 60950:2000
Europe	Europe: IEC60950, EN60950, EN60825-1 and EN60825-2
Japan	Japan: IEC60950

Acoustics

Table 6-5: Acoustics

Country Deployment	Description
Sound Pressure	25dB at 25C ambient ISO 7779 and section 8.5 of ISO 3744:1994(E)
Sound Power	<40dB at 25C ambient ISO 7779, section 8.6 of ISO 3744:1994(E)

Product Markings

- cUL, FCC Statement, VCCI, CE, ICES.